PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference JP/5443899	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)

International application No. PCT/GB 03/04671	International filing date *(day/month/year)* 28.10.2003	Priority date *(day/month/year)* 29.10.2002

International Patent Classification (IPC) or both national classification and IPC
H04M3/51

Applicant
NOETICA LTD et al

1. This International preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 11 sheets.

3. This report contains indications relating to the following items:

   I   ☒   Basis of the opinion
   II   ☐   Priority
   III ☒   Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   IV   ☐   Lack of unity of invention
   V   ☒   Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   VI   ☐   Certain documents cited
   VII ☐   Certain defects in the international application
   VIII ☐   Certain observations on the international application

Date of submission of the demand 26.05.2004	Date of completion of this report 21.01.2005

Name and mailing address of the International preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Catley, I Telephone No. +49 89 2399-7201

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)):*

Description, Pages

1-24   as originally filed

Claims, Numbers

1-28   received on 29.07.2004 with letter of 28.07.2004

Drawings, Sheets

1/8-8/8   as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐   the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐   the language of publication of the international application (under Rule 48.3(b)).

   ☐   the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐   contained in the international application in written form.

   ☐   filed together with the international application in computer readable form.

   ☐   furnished subsequently to this Authority in written form.

   ☐   furnished subsequently to this Authority in computer readable form.

   ☐   The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐   The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐   the description,   pages:

   ☐   the claims,   Nos.:

   ☐   the drawings,   sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

   ☐ the entire international application,

   ☒ claims Nos. 27-28

   because:

   ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

   ☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

   ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

   ☒ no international search report has been established for the said claims Nos. 27-28

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

   ☐ the written form has not been furnished or does not comply with the Standard.

   ☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-26
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-26
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-26
	No:	Claims	

2. Citations and explanations

   see separate sheet

Reference is made to the following documents:

>D1: US-A-5 999 617 (NAKASE AKIHIKO ET AL) 7 December 1999 (1999-12-07)
>D2: US-A-5 819 029 (MARTINEZ ANDRES E ET AL) 6 October 1998 (1998-10-
>06)

Re Item V
Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1.   The invention is directed to the predictive dialling of outgoing calls from a call centre according to the progress of agents through scripted prompts, as defined by the predictive dialling system and method, scripting system and method, computer program and program product set-out in independent claims 1 and 14, 12 and 23, and 25 and 26 respectively.

   Document **D1**, which is considered to represent the most relevant state of the art, discloses a predictive dialling system for an outbound call center (abstract). Statistical data of previous calls is recorded (column 9, lines 51-61) and used to estimate the time required for calls to complete. This estimate is improved by detecting execution of a specific portion of the program on the operator terminal (abstract and column 7, line 66 - column 8, line 1), which is representative of a conversation nearing completion.

   The **disadvantage** of this prior art lies in the reliance on a single signal indicating imminent completion of the call in combination with historical timing data, which may not be appropriate for the specific call concerned.

   The **difference** between the claimed subject-matter and that disclosed in D1 is that the former defines the conversation as being driven by a series of script- prompted questions and that a series of status signals are communicated from the agent workstation to the predictive dialler in order to monitor the progression of the agent through the script.

   The objective technical **problem** to be solved by the invention can therefore be seen as how to better predict call completion times for specific calls.

When considering this problem, the skilled person may indeed consult D2, which also describes a system employing a predictive dialler (column 9, lines 45-51). Although this document focuses on the elimination of the need for constant live agent interaction, it nevertheless describes the use of scripts (column 10, lines 15-63) to control an IVR in dialogue with a customer. **However**, although the skilled person may be driven to combine D1 and D2 in order to trigger the generation of the completion prediction signal in accordance with the agent reaching a certain point in a prompt script, this would still fall short of the claimed **series** of status signals in order to monitor **progression** through the script.

Thus the independent claims are acknowledged to be **both new and inventive** and hence meet the requirements of the Articles 33(2) and (3) PCT.

2. Since claims 2-11, 13, 15-22, and 24 are all dependent on the aforementioned claims, they also fulfil the requirements of Articles 33(2) and (3) PCT with respect to novelty and inventive step.

3. The following points must nevertheless be observed:

3.1. Independent claims 1, 12, 14, 23, 25 and 26 are not in the two-part form in accordance with Rule 6.3(b) PCT.

3.2. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

3.3. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in documents D1 and D2 is not mentioned in the description, nor are these documents identified therein.

CLAIMS

1.   A predictive dialling system for a call centre including a plurality of agent workstations, each agent workstation comprising:

means for producing signals effective to cause a display to display a script for prompting the agent in a telephone conversation with a telephone respondent;

means for entering information obtained from the telephone respondent in response to questions prompted by the script into the workstation; and

means for producing a series of status signals indicative of the progression of the agent through the script;

the predictive dialling system comprising:

means for storing statistical data regarding the connection of previous telephone calls;

means for progressively receiving the series of status signals produced by each agent station;

means for predicting from the statistical data and those of the series of status signals received at any time how many new calls should be dialled to enable agents who have finished their previous call by the time each new call is answered by a respective telephone respondent to take all the new calls; and

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means for generating signals effective to cause said new calls to be dialled.

2.   A predictive dialling system according to claim 1
including a database system for storing telephone numbers
to be called, and a cache for storing a selection of the
stored telephone numbers, wherein when the predicting
means predicts the number of new calls to be made, the
appropriate number of telephone numbers are retrieved
from the cache.

3.   A predictive dialling system according to either of
the preceding claims wherein the statistical data
comprises the percentage of successful telephone
connections made out of the total number of calls over a
predetermined period of time.

4.   A predictive dialling system according to any one of
the preceding claims wherein the statistical data
comprises an indication of the number of calls in excess
of the number of available agents which the system can
tolerate.

5.   A predictive dialling system according to any one of
the preceding claims wherein the statistical data

includes the ratio of the nuisance call rate to the nuisance call rate target.

6.   A predictive dialling system according to any one of the preceding claims in which said means for predicting is arranged to predict the number, N_{dial}, of calls from the number of available agents currently not engaged on a call, the number of agents who have currently reached predefined points within a script, the percentage of successful connections out of the total number of calls made in a predetermined time period, the percentage of successful connections out of the total number of calls made over a predetermined time period, and the percentage of calls answered with no agent available to take the call over a predetermined time period.

7.   A predictive dialling system according to claim 6 wherein

$$N_{dial} = I + \frac{\alpha I + \beta R + \chi A + \delta G}{S_r(\theta + \tan(\frac{\pi N_r}{2N_t}))}$$

where I is the number of available agents currently not engaged on a call;

R, A and G are the number of agents who have reached

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predetermined points in their respective scripts and have sent said status signals to the predictive dialling system;

α, β, χ, δ are constants;

5   S_r is the percentage of successful connections out of the total number of calls made measured over a predetermined time period;

θ is an adjustment constant;

N_r is the percentage of calls answered by a telephone

10   respondent but with no agent available to take the call measured over a predetermined time period; and

N_t is the target percentage of calls answered by a telephone respondent but with no agent available to take the call.

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8.   A predictive dialling system according to any one of the preceding claims including means for adjusting the parameters used by the means for predicting.

20   9.   A predictive dialling system according to claim 8 including means for providing a user interface enabling display of the statistical performance of the system, and means for enabling a user to adjust said parameters.

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10.   A predictive dialling system according to any one of
the preceding claims in which where the number of calls
which are predicted is less than the calls which are
currently being dialled, the system includes means for
cancelling some of the calls currently being dialled.

11.   A predictive dialling system according to any one of
the preceding claims including means for sending a signal
to a workstation effective to initiate the running of a
new script at the workstation when the workstation has
been allocated a new answered telephone call.

12.   A scripting system for use in an agent workstation
in a call centre, the workstation comprising:
        means for receiving telephone calls; and
        a display means;
        the scripting system comprising:
        means for providing signals effective to cause the
display means to display a script for prompting an agent
in a telephone call with a telephone respondent;
        means for recording information obtained from the
telephone respondent and sending signals representative
of said information to a storage means;
        means for producing a series of status signals

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representative of the progression of the agent through the script; and

    means for progressively sending said series of status signals to a predictive dialling system.

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13.   A scripting system according to claim 12 including means for receiving signals from the predictive dialling system effective to initiate the display of a new script synchronised with the receipt of a new telephone call.

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14.   A predictive dialling method for a call centre including a plurality of agent workstations, each agent workstation performing the steps of:

    producing signals effective to cause a display to display a script for prompting the agent in a telephone conversation with a telephone respondent;

    entering information obtained from the telephone respondent in response to questions prompted by the script into the workstation; and

20   producing a series of status signals indicative of the progression of the agent through the script;

    the predictive dialling method comprising:

    storing statistical data regarding the connection of previous telephone calls;

25   progressively receiving the status signals produced

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by each agent station;

predicting from the statistical data and those of the series of status signals which have been received at any time how many new calls should be dialled to enable agents who have finished their previous call by the time each new call is answered by a telephone respondent to take all the new calls; and

generating signals effective to cause said new calls to be dialled.

15. A predictive dialling method according to claim 13 including storing telephone numbers to be called in a database system, and storing a selection of the stored telephone numbers in a cache, wherein when the predicting means predicts the number of new calls to be made, the appropriate number of telephone numbers are retrieved from the cache.

16. A predictive dialling method according to claim 14 to 15 wherein the statistical data comprises the percentage of successful telephone connections made out of the total number of calls over a predetermined period of time.

17. A predictive dialling method according to any one of

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claims 14 to 16 wherein the statistical data comprises an indication of the number of calls in excess of the number of available agents which the system can tolerate.

5   18. A predictive dialling method according to any one of claims 14 to 17 wherein the statistical data includes the ratio of the nuisance call rate to the nuisance call rate target.

10   19. A predictive dialling method according to any one of claims 14 to 18 in which where the number of calls which are predicted is less than the calls which are currently being dialled, cancelling some of the calls currently being dialled.

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20. A predictive dialling method according to any one of claims 14 to 19 in which said predicting step predicts the number, N_{dial}, of calls from the number of available agents currently not engaged on a call, the number of

20   agents who have currently reached predefined points within a script, the percentage of successful connections out of the total number of calls made in a predetermined time period, the percentage of successful connections out of the total number of calls made over a predetermined

25   time period, and the percentage of calls answered with no

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agent available to take the call over a predetermined time period.

21. A predictive dialling method according to claim 20 wherein

$$N_{dial} = I + \frac{\alpha I + \beta R + \chi A + \delta G}{S_r(\theta + \tan(\frac{\pi N_r}{2N_t}))}$$

where I is the number of available agents currently not engaged on a call;

R, A and G are the number of agents who have reached predetermined points in their respective scripts and have sent said status signals to the predictive dialling system;

α, β, χ, δ are constants;

S_r is the percentage of successful connections out of the total number of calls made measured over a predetermined time period;

θ is an adjustment constant;

N_r is the percentage of calls answered by a telephone respondent but with no agent available to take the call measured over a predetermined time period; and

N_t is the target percentage of calls answered by a telephone respondent but with no agent available to take

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the call.

22. A predictive dialling method according to any one of claims 14 to 21 including the step of sending a signal to a workstation effective to initiate the running of a new script at the workstation when the workstation has been allocated a new answered telephone call.

23. A scripting method in an agent workstation in a call centre, the workstation comprising:

    means for receiving telephone calls; and

    a display means;

    the scripting method comprising the steps of:

    providing signals effective to cause the display means to display a script for prompting an agent in a telephone call with a telephone respondent;

    recording information obtained from the telephone respondent and sending signals representative of said information to a storage means;

    producing a series of status signals representative of the progression of the agent through the script; and

    progressively sending said status signals to a predictive dialling system.

24. A scripting method according to claim 23 including

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the step of receiving signals from the predictive dialling system effective to initiate the display of a new script synchronised with the receipt of a new telephone call.

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25. A computer program including processor implementable instructions for performing a method according to any one of claims 14 to 24.

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10   26. A computer program product carrying a computer program according to claim 25.

27. A predictive dialling system substantially as hereinbefore described with reference to the accompanying
15   drawings.

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28. A predictive dialling method substantially as hereinbefore described with reference to the accompanying drawings.